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ABSTRACT

Critical reflection plays an integral part in independent problem-solving and self-regulated learning. Metacognition, which is knowledge of a task and of the thinker's own cognitive processes, and monitoring, the ability to assess and adapt thinking when problems become apparent, are elements of reflective thinking. Research shows that experienced writers undertake constructive planning when creating and integrating complex networks of goals and strategies. To discover the role of critical reflection in collaborative writing, 22 first-year college students enrolled in 2 core composition courses were encouraged to engage in collaborative planning. Students were to identify discourse problems from their own lives, apply readings on the subject of how language and conceptual labels affect what is seen and known, and prepare "planning blackboards" before writing. While planning, students did not behave like novice writers, but devoted attention in their discussions to the purpose/key point of their writing, as well as their intended audience. Collaborative planning styles fell into a "checklist approach" (using the planning blackboard as a checklist) and an "interactive approach" (introducing and reacting to key points). Overall, a positive correlation was found between the amount of reflection that went into a student's writing and the quality of that writing. (Two tables of data and two figures are included.) (SG)

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PLANNING TEXT TOGETHER:
THE ROLE OF CRITICAL REFLECTION IN STUDENT COLLABORATION

Lorraine Higgins, Linda Flower and Joseph Petraglia

Critical Reflection: Its Function and Intellectual Value

The progressive educator John Dewey (1933) once argued that human intelligence is cultivated through reflective thinking. When individuals examine and test their ideas for a purpose, they are better able to use their knowledge in informed and self-directed ways. Dewey explained, "By putting the consequences of different ways and lines of action before the mind, it [reflection] enables us to *know what we are about* when we act." (p.17)

Today, educators have recognized that reflective thinking enables individuals to assess and adapt their thinking as they carry out intellectual tasks. Reflection plays an integral part of independent problem-solving and self-regulated learning (Bandura, 1986,1989; Zimmerman, 1989; Bransford, 1979; Bransford, Sherwood, Vye & Rieser,1986), helping students transfer and apply their knowledge and skills to situations beyond the classroom.

While most educators would not debate the educational value of reflective thinking, there has been some debate about how it operates and the conditions under which individuals are likely to engage in and benefit from reflection. Cognitive theorists have recognized two important aspects of reflective thinking: *metacognition*, knowledge of the task and of one's own cognitive resources, and *monitoring*, the ability to assess and adapt one's own thinking when problems become apparent. Flavell (1979) argues that metacognitive knowledge is tacit but may rise to awareness when individuals experience difficulty. For example, readers may call on their knowledge of task goals (to learn the main points in a text) and potential strategies (look for the topic sentences) when they sense that they are having trouble with a particular passage. Thus, Flavell sees metacognition as a distinct aspect of reflective thinking, but suggests that it surfaces as individuals detect some problem with their performance. In contrast, Paris (1988) argues that it makes little sense for educators to distinguish between tacit knowledge of goals, tasks and strategies, and conscious awareness and use of these phenomena, as we can only hope to observe and teach what is consciously used. For Paris, metacognition is never distinct from monitoring activity; they are inextricably bound. Brown (1985) agrees that it may be impossible to disentangle the two, arguing that awareness of cognition and regulation of cognition work together. In this paper, we use the broader and more familiar term critical reflection to refer to individuals' self-conscious and critical thinking about their own ideas and processes as they work through an intellectual problem. We assume that reflection requires some level of awareness of task and of one's own approach to it; however, reflection goes beyond self-awareness: when individuals engage in reflection they use their awareness to *critically evaluate* their own thinking in order to achieve some goal.

Research on metacognition in reading tasks (see Garner, 1987 for an overview) illustrates

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some ways in which awareness and monitoring may interact. Good readers keep track of their understanding, note difficulties and consciously reflect on task goals when they feel they don't understand; poor readers do not (Palincsar & Brown, 1984; Brown, Campione & Day, 1981). Paris, Wasik & Turner (in press) explain that these readers do not fail to reflect on their own process, but that they use reflection in inappropriate ways. They explain how young readers often view reading as a decoding task rather than a meaning-making enterprise; as a result they often don't know when they have failed to comprehend the gist of a text. Their monitoring is often focused at the level of understanding individual words rather than reflecting on the meaning of larger passages. This research suggests that reflection as self-directed monitoring is not in itself a valuable activity; its benefits may depend on whether the individual also has an appropriate understanding of the task.

While many thinking tasks are fairly automatic in that they are well practiced and require little self-conscious reflection, researchers have discovered that reflection is likely to occur under difficult or unfamiliar task conditions (Flavell, 1979; Perkins, 1981). As we struggle with choices in how best to approach difficult tasks, the goals we set and the strategies we engage in become salient to us. This heightened awareness allows us to keep track of what we are doing and to evaluate how we are doing. However, this self-consciousness may not be efficient or necessary when a task is going smoothly. Reflection may surface, submerge and resurface as individuals carry out a particular task.

Overuse of reflective activity may even hinder success in certain tasks. For example, when second language learners monitor their use of a foreign language too closely (e.g., when they constantly check the rules of correct usage), it may interfere with their ability to develop fluency in the language (Krashen, 1981). Duemler and Mayer (1988) have found hidden costs of critical reflection in scientific reasoning tasks as well. For science problems that require creative brainstorming, too much critical evaluation too soon can prematurely cut off ripe hypotheses and new ideas that might eventually prove useful to problem solvers.

Critical Reflection and Writing

One might expect that reflection would play a critical role in writing tasks, since writing has been recognized as a typically ill-defined and complex form of problem-solving (Flower & Hayes, 1981). Many writing situations do not require the automatic application of a set of skills or conventions; rather writers must infer the specific goals of a "rhetorical situation" (Bitzer, 1968), monitoring and adapting their ideas and strategies to meet those demands. We know that complex tasks of this sort can be rich sites for reflective activity, yet ironically, the role of reflection in writing has not been widely studied as it has been in reading and general learning tasks.

We do know that not all writing situations are equally demanding of a writer, and, no doubt, constant attention to and reflection on one's process is not always necessary. When we scrutinize every move, our writing may take longer than necessary or we may become so self-conscious that it impedes our ability even to finish a sentence. At other times, we may expend too much effort reflecting on low level features of our writing (e.g., grammar and punctuation) at the expense of more global features (Rose, 1980).

There are many instances when constant reflection is not required, for example, when writers engage in familiar or well-supported tasks, slotting information into proven text formats or telling what they know about a subject. In these cases, writers can use existing text structures, the structure of a genre or their own knowledge to select information and present it to a reader. While each of these tasks may require writers to transform information to some degree, the transformation is relatively routine and the writer's planning and composing may require little reflection. In contrast, some writing situations may be so novel that a writer can't simply call on a practiced text convention or familiar schema. Much of the writing students face in college cannot be carried out by invoking the summary or personal response formats learned in high school (Curtin, 1988; Applebee, 1981, 1984). College students often must adapt and transform what they know or what they read to a variety of purposes they encounter in their courses, purposes other than recitation. They may be asked to interpret, evaluate or apply their knowledge to actual problems and issues. Flower, Schriver, Carey, Haas & Hayes (1989b) argue that this type of writing may require a great deal of *constructive planning* in which writers create and integrate a complex network of goals and strategies. The experienced writers they studied engaged in a good deal of self-consciousness as they planned for this kind of writing. They frequently monitored their understanding of the writing task, the goals they set and the ways in which they selected and adapted their ideas for the audience. A study by Durst (1989) also suggests that complex writing tasks can involve more self-monitoring. He found that high school students engaged in more monitoring as they tackled written analyses than when they wrote summaries of assigned texts. Students seemed to invoke and automatically apply their knowledge of summary writing with a fair amount of ease. The analysis task involved more self-awareness and monitoring overall. Moreover, the bulk of this reflective activity occurred in the planning stage of writing analyses, where students reflected on the demands of the analysis task and their understanding of the topic.

Scardamalia and Bereiter (1987), have shown that novice writers often resort to "knowledge-telling" when they attempt these more difficult writing tasks; that is, they funnel what they know about a topic straight into composing. For these writers, there exists no dialectical relationship between their topic knowledge and their rhetorical knowledge. That is, these writers don't reflect on topic information given their unique goals and plans. The research of Burtis, Bereiter, Scardamalia and Tetroe (1983) may give us a clue as to why. When asked to plan, younger writers don't create abstract goals and plans in the first place; they produce outline-like text fragments instead. More experienced writers, on the other hand, create plans in the form of abstract, rhetorical goals which look less like the texts they eventually produce. They use these goals to reflect on, select and adapt relevant subject matter.

Reflection can play an important role in helping students move out of knowledge-telling and into knowledge-transforming. Scardamalia and Bereiter (1987) provided students with prompts (in the form of index cards) to reflect on subject matter knowledge in light of rhetorical concerns. The reflective prompts (e.g., *elaborate, improve, consider alternative or new ideas, consider goals or purpose, and put these elements together)* resulted in large performance gains. But reflection may not just take subject matter knowledge as its object. Expert writers also reflect on their writing *goals* as they attempt to consolidate their knowledge about audience, purpose, and strategies. Expert writers in a study by Flower et al. (1989b) often recognized and resolved conflict at the level of these abstract goals and plans, while novice writers tended to resolve conflict

only at the level of the text-- what they would actually say. For difficult writing tasks that require constructive planning, it may be important to reflect on and refine both topic knowledge and rhetorical knowledge, the ideas one formulates for text as well as the larger goals that one infers and constructs from a particular task.

Collaboration: A Context for Fostering Reflection?

Although research suggests that successful writers often engage in reflective activity, we still have much to learn about the role it plays in student writing and whether or not it is possible to encourage reflection in the classroom. What kind of learning conditions might encourage reflection? Many composition teachers now feel that collaboration is an ideal context for fostering reflective thinking. Teachers assign peer discussion hoping it will help students reflect on their own ideas and writing processes.

Almost by its very nature, collaboration is assumed to involve reflection at some level. Bruffee (1984) argues that peer discussion externalizes writers' thinking, making students' ideas and writing processes more available for scrutiny. Indeed, addressing a real audience may give writers the opportunity to articulate their reasoning and perhaps even become aware of shortcomings and strategies they didn't think of on their own. But even if such interaction can heighten students' awareness of their writing plans and choices, awareness itself may not insure that students will reflect critically on those choices.

Some have argued that collaborative conflict can trigger critical reflection. When a collaborator disagrees, the writer may have to reassess her thinking in light of the competing viewpoint or approach (Johnson & Johnson, 1979; Forman & Cazden, 1985). This assumes that the writing partner or respondent can be a stimulus, prompting the writer to reflect on her own ideas or prose. In a study of joint problem-solving, Perret-Clermont (1980) argues that this type of self-assessment and cognitive reorganization is often initiated when partners hold different views to begin with. But as Forman and Cazden (1985) point out, these conclusions are based on studies that *assign* collaborators alternative perspectives and stipulate that they *must* reach consensus. In natural collaborations, the importance of cognitive conflict would depend on the kind of interactions students actually have. Do the students disagree with each other and, if so, will they express it? Is consensus absolutely necessary when the text is singly authored and the role of the collaborator is to give support and advice? When conflict emerges, is it resolved, ignored or circumvented? We would expect that these variables affect both the presence and the role of reflection and a student's (possible) subsequent revision of ideas.

Peer cooperation, not conflict, may also enhance reflection. Research in cooperative learning suggests that a partner may extend a person's resources for spotting and working on task problems. The partner extends the problem-solver's choices and provides a range of alternatives from which to draw. Forman (1981) looked at collaborators solving chemical experiment problems and found that those engaging in "cooperative interaction" (in which both partners reflect on ideas and coordinate work) were more likely to carry out combinational strategies necessary for solving harder problems. Indeed, cooperation may help a writer achieve what he can not yet achieve

but has the potential to, with external support (Vygotsky, 1962). Awareness of *alternative* points or strategies, not necessarily *rival or opposing* ones, may enlarge a writer's repertoire and help him to view his approach as a choice among options and to discriminate among those choices.

The benefits of collaborative awareness, conflict and cooperation are difficult to track. Although some researchers have attempted to evaluate pre- and post- products to measure individual performance before, with and after collaboration, the results of these studies are highly inconclusive, probably because the kind and structure of the collaboration and the writing tasks themselves vary so widely from one study to the next. (Smit, 1989; Higgins, 1989) In the remainder of this paper, we explore these assumptions about critical reflection and collaboration, discussing whether and how student writers actually engaged in reflection as they collaborated on plans for a course paper.

The Role of Reflection in Collaborative Planning: Purpose and Context of the Study

This study examines the role of critical reflection in the context of peer planning. Our observations challenge and shed light upon assumptions about the presence and role of critical reflection in student collaboration; however, it is not our purpose here to "test" collaboration as a method of teaching reflection in the short or long term or to argue that collaborative planning itself causes the type of critical reflection we observed. Rather, we assume that this context provides an invitation for students to engage in reflection and an opportunity for us to observe whether students take up or refuse the invitation in this context, and how and why they might do so. We had three questions. First, *Does peer planning necessarily involve critical reflection, as many advocates of collaboration might expect?* We wondered what kinds of awareness collaboration would engender and whether or not this awareness would lead to critical reflection (as some assume) in a setting that supported reflection by prompting rhetorical thinking about the task (unlike many open-ended approaches). In that reflection is assumed to help writers refine and adapt their ideas, we also asked, *Does Reflection Contribute to the Quality of Students' Planning?* And finally, we asked, *If and when students do engage in reflection, how do they use it?*

In order to create a situation conducive for studying reflection, we asked 22, first-year college students enrolled in two core composition courses to engage in "Collaborative Planning" (Flower, Burnett, Hajduk, Wallace, Norris, Peck & Spivey, 1989a). Collaborative Planning is a loosely structured planning process in which a writer explains and elaborates his or her plan to a Supporter. The Supporter asks questions and encourages the writer to develop his or her plan, aided by a set of rhetorical prompts. The two partners then switch roles so the second writer has a chance to talk out his or her plan. The rhetorical prompts are embodied in the notion of a "Planner's Blackboard," a visual metaphor that encourages students to develop plans for each of several blackboards which reflect familiar elements in successful, rhetorical planning: the *purpose or key point* for writing, the intended *audience* and relevant text *conventions* . (See Figure 1).

These blackboards highlight rhetorical issues such as purpose and audience, issues which inexperienced writers often ignore (Carey, Flower, Hayes, Schriver & Haas, 1989). As

background for these rhetorical concerns, students are also asked to discuss relevant *topic information*. Moreover, because experienced writers often review and forge links among these aspects of a plan while inexperienced writers do not (Flower et al. 1989b), the method reminds students to *consolidate* these plans periodically (symbolized by the arrows linking the blackboards to one another). Consolidation is a move whereby writers interrelate multiple aspects of the plan. For instance, they might consider how to adapt their *key point* to the interests or needs of the *audience* or how different ways of organizing the paper (*text conventions*) might help them carry out their *purpose*. Thus, Collaborative Planning is used as a means of social support and as an instructional aid for moving students beyond topic information and into more rhetorical, constructive thinking.

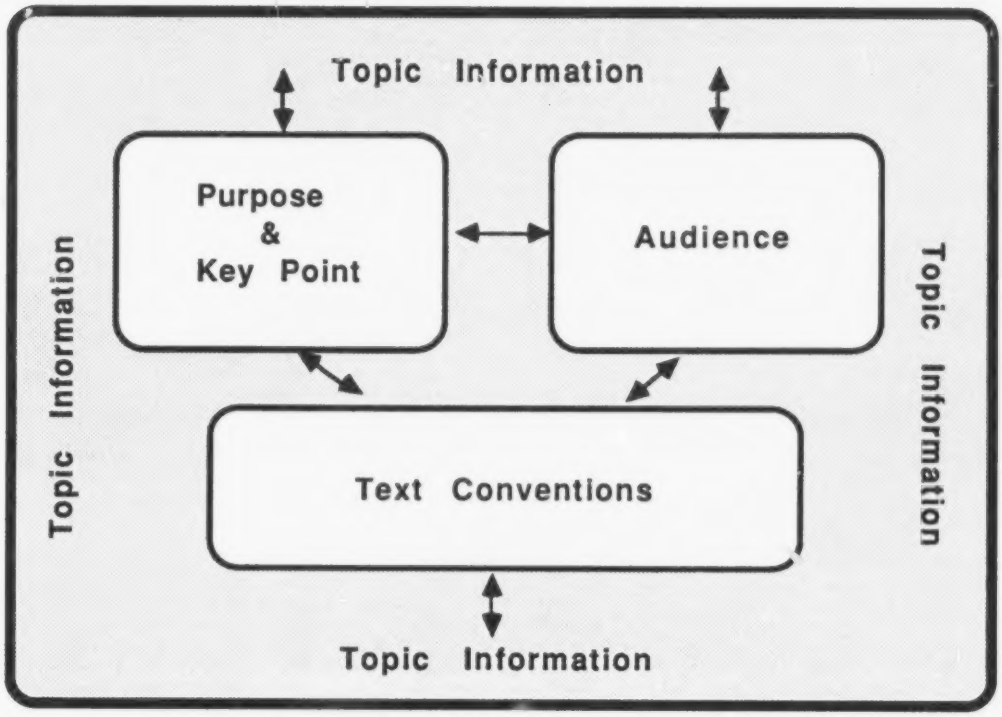

Figure 1. <u>The Planner's Blackboard</u>

After receiving an explanation of Collaborative Planning and some practice with it on early course papers, students were assigned a paper in which they were to find and address an actual "discourse problem" in their own lives or in an actual discourse community. They were asked to use and adapt readings from two chapters in Peter Farb's *Word Play* (chapters on how language and conceptual labels affect what we see and know). Earlier assignments had focused on finding and defining problems and on

the idea of discourse communities. Students were asked to consider

> a realistic "discourse" problem you or other students encounter. As you plan the paper, give some thought to your own purpose in writing the paper. Sometimes people analyze a problem in order to think a question through for themselves. Or in order to explain a problem or issue to someone else. Or maybe to discuss a possible solution to a problem or even to persuade readers to act on one solution. Decide on your own purpose, let your reader know what it is, and use it to organize your paper. What do you want to accomplish in this paper?

Students were urged to keep the rhetorical issues represented by the blackboards in mind as they planned their papers alone and later as they met to discuss plans with their planning partner. The collaborative sessions were tape recorded.

One purpose for the tapes was to observe students' response to the rhetorical prompts. An initial analysis of this data used the planning blackboards as a coding scheme, in order to determine students attention to and representation of various aspects of the plan. This initial analysis, which gives a background for our present discussion, is discussed elsewhere in detail (Petraglia, Flower & Higgins, in prep.; Flower, Higgins & Petraglia, in press), but will be briefly synopsized here. A second analysis of the data focused on reflection, the subject of this paper. The reflection analysis employed a coding scheme to observe the presence and frequency of reflection, quality ratings for each planning session, and a descriptive analysis of reflective patterns that emerged in the taped discussions. This information allowed us to determine whether and how students engaged in reflection and whether reflection lead to high quality planning.

One might imagine that these planning sessions would be a useful place to observe reflection, especially because the method and task specifically invite students to transform and adapt their reading for a particular audience and purpose. The initial, private planning stimulates an awareness of plans, while the additional collaboration gives students the opportunity to reflect and elaborate on plans with a responsive, questioning partner. One might also expect that the consolidation prompt would invite reflection in that it asks students to consider the relationship between topic information and the purpose and audience they have stipulated. This type of consolidation might help students check the consistency and coherence of their plans and to identify gaps or contradictions in them. In addition, the taped discussions make students' reflection "visible" to us in a way that is less artificial and intrusive than protocol methods, which ask students to think aloud while writing privately.

Focus of Attention and Reflection in Planning: Background and Report of the Study

Students' Focus of Attention in Planning

Our initial analysis described the features students attended to as they planned. Did they attend to audience, topic information or other features of the planning blackboards? Because students' awareness of rhetorical and other features of the plan seemed to affect the nature of their reflection, we summarize the results of this initial analysis first.

We were interested in the proportion of planning devoted to the various blackboards, especially students' response to rhetorical issues. Transcripts of the sessions were produced, each conversational turn constituting a numbered episode. Each episode was coded in terms of the blackboards, for example, whether the episode referred to audience, purpose, text convention, etc. An additional category was created for "off task" episodes, those which contained no substantive information, but may have contained superfluous or general process comments or questions. Interrater reliability for this coding, using 20% of the data, was 73% (Cohen's Kappa).

As Figure 2 shows, these students did not behave like typical novice writers while engaging in collaborative planning. In this context, students resembled more expert writers; they moved beyond discussion of topic information alone, focusing a great deal of attention (roughly 39% of their planning) on purpose/key point, and some attention to audience as well (19%). However, a closer look reveals that students' planning at this phase of their learning is more of an approximation to expert planning than an equivalent to it. While students no longer resembled the knowledge-telling writers described by Scardamalia and Bereiter (1987), we discovered that they interpreted purpose and audience in unique ways, sometimes but not always resembling the ways in which expert writers discuss these rhetorical elements of a plan.

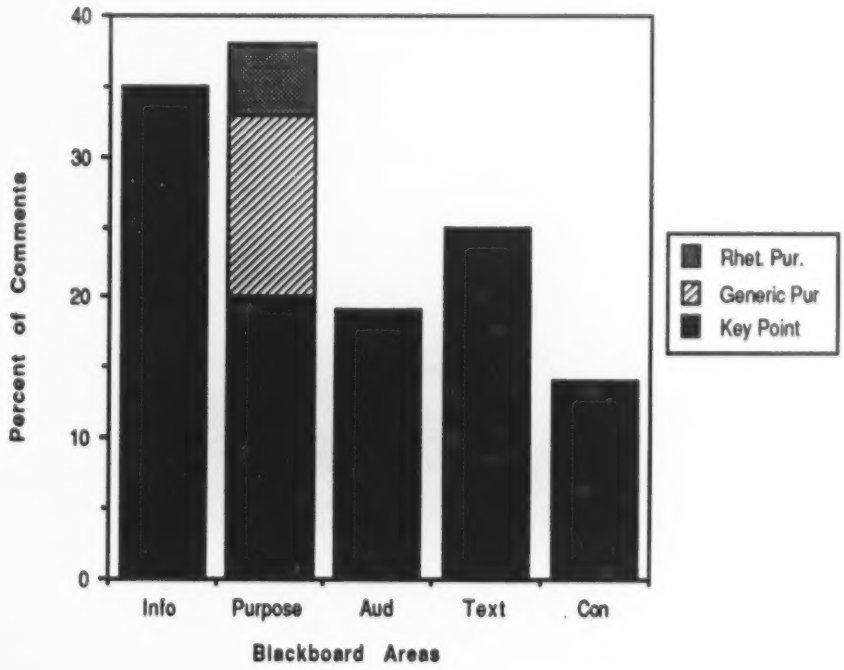

Figure 2. Focus of Attention in Student Planning

Students often interpreted their partners' request for purpose as a call for a thesis statement-- what they would *say* in their texts as opposed to what they hoped to do. We coded these key point or thesis remarks separately and discovered that nearly half of students' attention to purpose focused on thesis statements. A total of 20% of their planning dealt with this issue of what to say. Moreover, when students discussed purpose they also described a "generic" purpose, one that aimed to produce a certain kind of paper rather than to achieve a more specific rhetorical effect. For example, "My purpose is to write a problem-solution paper" or "My purpose is to write my feelings on . . ." or "I want to compare and contrast. . ." are generic purposes. Rhetorical purposes are comments that indicate a more specific or unique purpose adapted to some particular end. For example, one student wanted to convince high school students that they would need to use many different writing styles across their college courses, ". . . so they can catch on to this, to these differences sooner than I did." He then provided some evidence he planned to use-- how his English course required a different kind of paper than his engineering course. While 13% of students' planning was devoted to generic purposes, in the end only 5% of their planning was devoted to the kinds of rhetorical purposes so often considered in expert planning. Nearly all of students' "purposive" remarks either described what they would say or what form the paper would take rather than the effect they wanted to produce. Even when prompted to create specific rhetorical purposes, most students did not, but instead set out to produce a specific text type or genre.

Although students also devoted a fair amount of attention to audience, they also represented audience in a unique way. Audience discussion was often limited to identifying one rather than inferring some need or other quality thereof, considerations that expert writers often attend to. Many students simply named a fictional audience for the thesis they had already chosen rather than tailoring what they would say for the needs and problems of a particular audience.

These students are clearly at an interesting juncture; they are not quite novices at planning and yet not quite expert. In the process of learning to plan more complex kinds of texts, texts that must adapt information in purposeful ways, these students seems to stand somewhere at the crossroads. How will students at this phase of their learning employ reflection, students attempting to tap issues of purpose and audience in ways that neither expert nor novice profiles have yet accounted for? These students' text-driven interpretations of purpose and audience, combined with their focus on topic information (35%) has implications for the presence and type of reflection we observed. In what follows, we will discuss this relationship in more detail.

Examining the Presence and Role of Reflection

Does peer planning necessarily involve critical reflection?

Given the way in which students focused their attention in these sessions, to what extent did they engage in reflection? In answering our initial question, our analysis makes an important distinction between critical reflection and awareness. Although *mentioning* one's plans indicates awareness, and although awareness may have to precede critical

reflection, we think it necessary to be rigorous in distinguishing between these two processes, especially in a study of planning. In a protocol study by Durst (1989), coding for monitoring included any remarks in which writers reflected on the significance and appropriateness of their ideas and actions, *as well as* remarks in which students showed awareness of the task or of their goals and strategies. We chose a more conservative coding scheme, coding only for remarks that went beyond awareness. For students who are explicitly asked to discuss plans (as is the case in our study) will automatically become "aware" of goals and ideas; however, they may not necessarily engage those goals and ideas in a critical way. In returning to the planning transcripts, we coded each conversational turn (episode) as reflective or non-reflective. Reflective comments included comments in which students discussed the reasoning behind their plans or evaluated or compared their choices. Our reliability for the reflection coding was .89, using pairwise comparison.

Reflection took three forms in student planning, the most obvious being *problem identification or evaluation*. Although short, positive evaluations such as "yeah," or "good" were common; they often functioned simply to move a discussion forward and were not coded as reflective. Positive evaluations were reflective when they were more substantive, as in this writer's remark: "I... In fact, that's a good idea, because what - what I could be doing is taking something that I've read and applying it to something that's relative in our life or our community." Negative evaluation, on the other hand, always indicated some critical consideration of the choices being articulated, for example, "It doesn't seem like much of a point to me" or "That'd be very- too hard." At other times, students recognized an unknown, need or gap in the plan, which also implied reflective evaluation.

In addition to problem identification and evaluation, students engaged in a second form of reflection as they generated and compared *alternative plans and ideas*. Here, the Supporter suggests an alternative language problem that Fran might write about. Prior to this, Fran had considered addressing problems with foreign language translation. Here, the two partners reflect on another possibility: writing about language differences in geographic communities:

Bob *. . .What you could do is maybe compare the Northeastern society with one that's supposedly more relaxed.*

Fran *I could do that, but I don't really know enough about the societies to really make it... I don't know how I could find these things out to make it really substantial.*

Adversatives such as OR and INSTEAD often implied a critical choice or comparison between options. Additives, as in a string of possible ideas (e.g., and maybe I'll do this and this... or this...) indicated an awareness of options but no deliberation about them, especially when options were named but not discussed or explained at length. We therefore took a conservative line when coding these for reflection.

A third form of reflection emerged as students *justified their choices*. BECAUSE, SO and SINCE were useful linguistic markers for coding. Students not only justified what they wanted to say (their main points) but also justified their choice of purpose, audience and text conventions. Here a writer justifies why psychologists might be a good audience for her

topic, inaccuracy in story telling:

> **Jennie** *I think a lot of psychologists or psychology majors especially are gonna be interested in this, SINCE maybe speakers when they relate past events, they do - they change it subconsciously... I think the psychologists would be interested in how their mind twists things around.*

Students, on average, devoted nearly a quarter of their sessions to reflection. (See Table 1). However, contrary to assumptions in the literature, collaboration did not *necessarily* bring about critical reflection. Two pairs of students engaged in none at all, even though they attended to the blackboards (they were on task), while four more pairs produced only one or two reflective comments during the entire planning session.

Student	No. Reflections	% of Session
Jennie	39	31
Liz	37	36
Carter	34	25
Han	29	45
Patrick	28	37
Paul	28	31
Fran	27	48
Kate	19	33
Vince	17	17
Ben	11	14
Bob	11	28
Gary	8	42
Linda	7	18
Tracy	6	14
Tomas	4	4
Laura	2	8
Lisa	2	13
Sara	0	0
Chanda	1	3
Janine	1	4
Yun Ho	0	0

Table 1. Number of Reflective Episodes and Percentage of Planning Session Devoted to Reflection Per Student

This information provides us with a picture of what happened: some students used reflection while others did not. This in itself challenges the assumption that collaboration will necessarily induce reflective thinking. But, perhaps a more interesting question is why this might be so. What contributes to these individual differences?

One advantage of descriptive data of this sort is that it allows us to get behind the scenes, to

observe the logic behind students' performance. If we go beyond the numbers and begin to look at how these students approached peer planning, we begin to understand these individual differences, and more importantly, the possible logic behind those differences. In what follows, we use our observations to sketch out three possible sources that may influence whether and how students engage in reflection. These include: *the way students represent collaboration, the way they represent the goals of the writing task and the degree to which they are aware of these goals as they plan.*

We noted at least two distinct interpretations of collaborative planning which may have influenced students' reflection. We call these the "checklist approach" and the "interactive approach." Consider for example, the following excerpt from Yun Ho's planning session. The transcript has been excerpted to show all comments made by Yun Ho's Supporter, Mike. This and the remaining examples include our coding in brackets, following each episode (see key). Reflective episodes are italicized. When we look at the entirety of Mike's input, we can see that he is using the planning blackboards as a checklist. In this case, Mike seems to interpret collaborative planning as a means of checking on whether his partner has "filled in" the blackboards.

KEY: Each turn is numbered; reflection is in italics; blackboard codings are labeled thus: A= Audience, R= Rhetorical Purpose, G= Generic Purpose, KP = Key Point, I = Topic Information and T= Text Convention. Consolidations are noted with slashes (/). O= Off or Non-substantive Question or Comment.

Example 1. The "Checklist" Approach
Yun Ho (Writer) & Mike

Mike	1. Okay, Yun Ho to start off with, what is the key point of your paper, what's the purpose? [O]
Mike	3. Okay, okay, so in other words your paper is on how certain words in English do not have meanings in other languages? [KP]
Mike	5. So, is color which was used in Farb, is that your only example, I mean, do you have anything else? [T]
Mike	7. Hold on a second, Yun Ho, my phone is ringing. Okay, we're back. As you were saying Yun Ho, some other ideas? [O]
Mike	8. So, let's see your topics then would be words that just don't directly translate, cliches and phrases. [I]
Mike	10. Are there any others? [O]
Mike	12. Okay, let's go on to the next thing. You're talking about your audience, your audience is going to be. . . [O]

Mike	14. Okay, so. . . I'm going to skip over text conventions first, save that for last. How are you going to organize all of this? [O]
Mike	16. Okay, but what I was talking about was, do you have any idea on how you're going to organize the whole report? [O]
Mike	18. Okay, then Yun Ho, is there anything else you might want to add, like some other ideas that you've been thinking about? [O]
Mike	20. Okay, then, well that's the end of this interview then. [O]

Mike turned the planning blackboards into a list of questions, going through each as he would a checklist, until he obtained all the information under each question. After Yun Ho states his key point, Mike asks for examples and checks to see if he has heard them all ("anything else?"). He then repeats Yun Ho's response, checks again, ("any others?") then moves on to the next blackboard (audience) and finally repeats the procedure with the text convention blackboard. This approach gave Yun Ho the opportunity to recite his plan, and in doing so he was no doubt made aware of his key points, audience, and plans for organization; however, this approach did not help this writer reflect critically on his plans; Yun Ho's session contained zero reflective comments.

In contrast, Liz and Patrick assumed a more interactive approach. In Example 2, Liz, the writer, introduces her key point: different discourse communities have trouble communicating, due to their specialized terms and vocabulary. Here, Patrick notes that Liz's thesis simply paraphrases the source and that she is not using the source in a unique way (a requirement of the assignment).

Example 2. The "Interactive" Approach
Liz (Writer) & Patrick

Patrick	*Right, that is a problem, I agree. But, don't get bummed out with me, but I mean do you have a, are you gonna suggest a solution or anything, that sort of sounds that you're in a way repeating what he [Farb] says. I don't know-- you know what I mean?* [G]
Liz	Aha. [O]
Patrick	*I mean I'm not sure, but ah, I mean if you could think of something that would help this out maybe, or summarize it in a way, do you know what I mean?* [G]
Liz	*Or, I could just... I think maybe what I'll do is use some of my own insight as far as I like maybe- as far as problems I run into. You know... Like... I mean, I'm not really sure how...* [G]

Although Yun Ho had the same problem (his thesis was also borrowed directly from Farb), his partner did not comment on it, but instead, moved on to the next blackboard. Liz's partner, however, does comment on this problem; in turn, Liz responds to his evaluation

with an alternative ("use some of my own insights"). In this interactive session, we see these writers commenting and responding to each other's insights about the plan. They not only rise to awareness of the plan, but also reflect on it. Over 1/3 of Liz's session was coded as reflective.

We can see that structured collaboration of this sort can easily elicit a writer's awareness of her ideas and plans, but whether she or her partner will go beyond awareness and begin to reflect critically on the plans may depend on the roles they assume and their vision of the collaboration. Indeed, other researchers argue that interactional patterns may affect the kind and quality of work students do (Smit, 1989; Lunsford and Ede, 1986, Freedman, Burnett & DiPardo, 1987). Nystrand (1986) shows us that different students represent and carry out collaborative tasks differently. Some may be content to find a problem or make a critique, while others may assume that collaboration requires them to work on those problem as well. And certainly some students may assume roles that are more socially acceptable or comfortable, allowing them to be a supportive listener but not requiring them to evaluate or challenge a friend's ideas. Our observations suggest that it may be wishful thinking to assume that collaboration necessarily engenders productive thinking of any sort; for the very nature of collaborative work can vary from one group of students to the next.

We also realized that these differences in reflection may have to do with the way students represent the goals and criteria of the writing task itself. As we noted earlier, students interpreted the purpose of this assignment in very different ways. Many students interpreted purpose simply as a call for a thesis statement, and subsequently borrowed an idea from Farb and reported on it. They did not create a unique rhetorical purpose that would allow them to adapt Farb to a particular language problem or community. Yun Ho and his supporter, Mike, may not have recognized that the assignment called for more than a report on a thesis from the source text. If this is indeed how they understood the task, then their lack of reflection on Yun Ho's purpose would be quite logical. It seems plausible that some students' lack of reflection might be due to their inappropriate understanding of the goals of the task, as in the case of the young readers we discussed earlier in the paper.

Of course, some students may, in fact, be aware of appropriate task goals and criteria but may negotiate a different task for themselves, one that deflects reflection and the very difficult rethinking and revision that might accompany it. This negotiation might be influenced by time constraints, a student's interest in the topic or her image of what she is capable of doing in a course paper. Indeed, students frequently mentioned that they lacked a purpose, but many seemed content or relieved to gloss over the problem, assuring themselves they could still produce an acceptable paper because they had a thesis. We illustrate this negotiative process elsewhere in more detail (Flower et al. , in preparation) but here is one sampling of it. In example 3, the Supporter comments that he hasn't really understood the writer's purpose, but both agree that a short paper makes it hard to do anything more substantive:

Example 3. Negotating the Writing Task
Tomas (Writer) & Vince

Tomas: 83. *Well, I don't really- I haven't really developed a purpose. I got a key point.* [R]

Vince: 84. *Yeah. So you don't have any purpose in writing this? It's not to like help people who don't know the meanings of these words?* [R]

Tomas: 85. Well, I mean it would help- it would help people understand why- why there's trouble. I mean there's- there are people who are ignorant and they don't understand that these are problems. [A/G]

Vince: 86. Yeah. I think the paper's a little too short to like. . . [T]

Tomas: 87. Yeah its a fairly short. . . [T]

Vince: 88. To go into anything like in depth. All right. . . [O]

Whether students are genuinely confused about the meaning of purpose in a particular writing task or whether they negotiate their own meaning, their vision of the task and the subsequent criteria they are willing to enforce can affect whether and how they notice and rethink problems with their plans.

Finally, these transcripts suggest that students' level of awareness may also account for differences in reflection. Students may be aware of appropriate task criteria *at some level* but may not attend to them in a self-conscious way. This seems to be the case with Liz. Initially, Liz seems to be unaware that she has not met the requirements of the task, but, with a little prompting from her partner she immediately sees it-- " Aha." Liz seems to recognize-- at some level-- that the assignment requires her to do more than paraphrase the source; yet she hasn't consciously controlled and used that knowledge. She needs a partner to help remind her of this and to push her into productive reflection.

Does Reflection Contribute to the Quality of Students' Planning?

Since the purpose of the planning session was to help students refine and develop their plans, we had the sessions scored for quality in terms of how generative and productive they were. Agreement among four raters, coding each session as high or low in quality, averaged 75% (pairwise comparison). We obtained an average quality score for each session by giving the session one point for every high rating it had received from any of the four raters. These final quality scores ranged from zero (low) to four (high). With these scores we were able to investigate the relationship between amount of reflection and quality of planning. We found that reflection and quality were positively correlated at the .001 level (Mann-Whitney). However, because verbal fluency can lead to longer papers, and because length often determines quality judgment, we realized that length itself may have contributed to this correlation. Even though raters were instructed not to judge quality on length, we ran a first order partial correlation, holding the effect of length constant. Even with the effect of length factored out, reflection was still significantly correlated with quality. ($r = .66$, $p < .05$, Pearson Product).

While reflective thinking is assumed to be educationally valuable in itself, this analysis suggests a relationship between critical reflection and the development of writing plans. The next section illustrates in some detail just how students were using reflection, but first, we wish to raise one final concern with quality: Does reflection in planning help students

produce better texts ?

Although future research needs to consider whether or not reflection in planning has any measurable impact on the texts students produce later, we offer some caution here. The relationship between one discreet episode of planning and the writing that may follow it may not be a simple, straightforward one. One cannot assume that the plan one observes in one research session is always the plan that has informed the text. Students often do subsequent planning that may drastically alter earlier plans. Moreover, situational constraints or personal limitations may make it impossible for students with great intentions to produce the text they had planned to. In the process of learning to write, college students may learn to engage in more complex kinds of planning as they set higher goals and tasks for themselves. This is in itself is a valuable lesson, and one that these particular students seem to be in the process of learning. But it may take some time before students learn to instantiate these complex plans into successful text, or to manage these sophisticated goals along with other writing demands. These are just some obstacles in attempting to examine relationships between discreet episodes of planning and single instances of text, obstacles future research will need to consider. In a subsequent analysis (Flower, Higgins & Petraglia, in press), we did discover that a high number of ideas developed by these writers in response to a partner's evaluations (within the planning session itself) did surface in the writers' written texts. These ideas surfaced in key places, in the form of important examples, opening paragraphs and the thesis itself.

How Did Students Use Reflection ?

The fact that these students engaged in occasional, evaluative or ruminative metacommentary is encouraging. But it doesn't tell us if this reflective activity is merely an ad hoc response in collaboration or if reflection shapes itself into larger, meaningful patterns within planning. These larger patterns of reflection might tell us more about how students use reflection to develop and generate plans.

One of the most striking patterns in the data was the presence of sustained reflection in the high quality sessions. These were places in which students used reflection over the course of five or more episodes, in succession. All eleven high quality plans contained these larger instances of sustained reflection, averaging over six sustained events per session. In contrast, only two of the eleven low quality plans contained instances of sustained reflection and they averaged two per session. What happened in these longer reflective events and how did they contribute to quality planning? We found that the three types of reflection, (evaluation/ problem identification, alternatives and justifications) seemed to work together in these longer reflections, helping students not only detect problems, but work on them as well, searching for alternative paths and evaluating new plans ideas.

We have already examined an excerpt from one on these longer episodes. We observed how Patrick tactfully recognized a *problem* with Liz's plan (she is paraphrasing the source text, not applying it to a problem). Liz responded with a new, albeit fuzzy *alternative* approach--to use her own insights. In the same breath, she notes a *problem*, saying "I'm not really sure how. . ." This problem recognition was followed by another reflective event lasting eight turns in which the writers searched for and *evaluated alternative plans* of action--specific ways that Liz might use her own insights in the paper. The partners hone in on one alternative: Liz might address two discourse communities right on her own campus, the art majors and the engineering students. Next, we see Liz *evaluating* this alternative, *justifying* why it might be a good solution.

Liz 27. *I... In fact, that's a good idea, because what - what I could be doing is taking something that I've read and applying it to something that's relative in our life or our community.* [G]

As this example illustrates, the three forms of reflective activity worked together in a typical problem-solving fashion: Here, Patrick detected a problem, the partners searched for a solution (a way to use Liz's insights) and then evaluated and justified alternative ways to instantiate that new goal. The *sustained* reflection allowed the writers to work through these phases of problem solving and to invent new approaches, to transform and adapt their plans.

Although this productive problem solving was initiated by the old, familiar "peer critique," Freedman, Burnett & DiPardo (1987) have argued that students often have trouble with peer evaluations of this sort. Other students we observed found an optional, and perhaps equally valuable way of initiating problem solving. In Example 4, Carter and Jennie show us how reflection can be initiated when writers juxtapose alternative plans with their own choices. Jennie's topic is "inaccuracy in story telling." She has already explained that when recalling past events, speakers rarely do so accurately, because of their own biases. Here, Carter asks whether she will present a solution to this problem.

Example 4. Jennie (writer) & Carter

Carter 46. You're gonna have a definite conclusion... So, what are you gonna try to do in this conclusion? Are you gonna try to have a solution? [G/T]

Jennie 47. Um... [O]

Carter 48. ... Or what? [G]

Jennie 49. *No. See, I really don't think there is a solution to this problem. Well, I guess... In a way there is a solution if people are aware of what they do, they can try to stop it. But I don't think that's really practical. think I'm just gonna tell about it. And just alert the listeners to past experiences, that they may not be hearing exactly what happened. I really don't think there is a solution to that.* [R/A/G]

Although Jennie justifies her approach, Carter continues to pose alternatives-- whether she will give "helpful hints" for story tellers or help people express themselves better:

Carter 50. *So you're gonna try to give maybe ideas or whatever, to maybe help people communicate the past better? [D/A]*

Jennie 51. *Um. No.* [O]

Carter 52. *Or, give helpful hints or something?* [G] (continued)

Jennie 53. I don't know. Do you think that would be a good idea? [O]

Carter 54. *I don't... Maybe if you like...* [O]

Jennie 55. *'Cause is there really a solution to that problem?* [G]

Carter 56. *Well, give a general idea... Or, maybe give a general idea of how you can express yourself. Well, I guess that...* [G]

Jennie 57. I think I was gonna... [O]

Carter 58. *...That'd be very - too hard.* [G]

Jennie 59. *...I think I was directing this more to the listener...* [A/R]

Carter 60. Hm-hm. [O]

In responding to these alternatives, Jennie articulates her own purpose and audience for the paper-- to direct the paper more towards the listener of stories-- those who hear past experience stories rather than to those who tell them. She compares and weighs these two alternative audiences, explaining why it would be more useful to direct this towards the listener rather than the speaker.

Jennie 61. *... A person hearing past events, rather than the speaker of them. And... (Excuse me) I'm trying to let the listener be aware of this, so that they can be more alert, and ask more questions, and just probe more to get the true story. Because, if you tell this to speaker... He might say.... Oh, yeah, yeah... And just tell the story anyways. But, you tell it to the listener... They'll be, you know, more aware, and try to get the true story.* [A/R]

Up to this point, Jennie had not articulated a purpose-- only a topic and thesis. She herself recognizes the value of this reflection in helping her flesh out weak parts of plan:

Jennie 105. *Well, thanks Carter. Um. Well, I really do want to thank you because you helped me with my conclusion. Before, like I knew I was gonna have a concluding paragraph, but I didn't really... (Laughs) That sounds so stupid, I know. But... And you always gotta have one. But I didn't really know what to put in it. And when you said.... Are you gonna have tips for the speaker, so he would - Um - know how to, you know, correct for himself... I was thinking... Hm... Is that the approach I want to use, or would I rather direct it more to the listener. And I decided that I think the listener would be better. . .* [R/A/T]

Although peer critique is probably the most commonly assigned form of collaboration, and although this type of reflection has the potential to spark critical problem solving, Jennie and Carter demonstrate another option. By posing alternatives rather than making direct criticisms, Carter helps Jennie focus on her own choices, and to explain and defend those choices without explicitly becoming confrontational.

All of the previous examples demonstrate the cooperative, problem-solving nature of reflection; but the roles that students assume in this cooperative work are not always distinguishable. Although some of the literature suggests that reflection is initiated when alternatives and conflicts are triggered by a collaborative *partner* (and Supporters in the previous examples did often act as triggers), the Supporters in this study were not always the initiators. In fact, writers themselves initiated reflection over 40% of the time. In collaboration involving peers of equal status, both or either partner can play the role of evaluator, idea generator, and reason-giver. One writer, Bob, provides an example of self-initiated reflection. His thesis is that engineers need to communicate with people outside their field and to become more socially involved. Bob also wants to recommend humanities courses for engineer majors. But in Example 5, he notes a problem; he is not sure how these two ideas are related.

Example 5: Bob (Writer) and Fran

Bob 19. *See, the thing is... They don't seem to ask.. It seems like it starting to become... You know... I'm gonna talk about the engineer as having a role in society. And I'm going to talk about the engineer as taking courses besides science courses. I mean, those are two different things. I don't know how I can get them related to. . . so, maybe I could use one to support the other. But I'm not sure how.* [I]

Bob continues to point out problems and to find a way to relate the two ideas. Although his partner lets him off the hook, he continues to elaborate on weaknesses in his plan, noting that his suggestions are too obvious:

Fran 24. *Yeah. Maybe a really large part of it is just getting them to realize that there is kind of a gap between the way they talk about things, and the way people can understand them, and once they realize that, maybe they can do it. But I don't know how... I don't know what you were planning to do. Well, it sounds like a good start.* [R/A]

Bob 25.*Yeah. . . I wish it was. . . I could go farther with it... I mean... It seems obvious... Everybody who's taking up engineering courses now probably already does know that or about how their work is becoming more involved with society. . .* [A]

Fran 26. Yeah. [O]

Bob 27. *I mean, I should be able to somehow show them something new. You know . . . I mean, even if I could just give it a different perspective.* [R]

Fran 28. *Well, maybe you're speaking to the engineers, giving them a perspective of like the rest of society. How society sees such technical people. I mean, I have friends that are scared of CIT* [technical] *majors.* [R/A]

This problem identification and evaluation help Bob monitor his work and set new goals for revising or generating new plans. He begins to articulate a new goal-- that his paper should tell engineers something new-- show them a new perspective they haven't yet considered. The partner (an art major) later supports his search for a new perspective, offering Bob the art community's perspective on technical students.

In each of the previous three examples, students are are using reflection to construct and refine the larger rhetorical goals of their papers, mainly their purpose and audience. This was quite typical. Students reflected on their rhetorical and generic purpose 73% and 61% of the time they discussed these blackboards and reflected on audience and blackboard consolidations nearly half the time they discussed those aspects of the plan. As Table 2 shows, they found the need to *reflect* on these larger rhetorical concerns more often than they did other aspects of the plan.

Blackboard	**% w/ Reflection**	**Reflective Turns**	**Total Turns**
Rhetorical Purpose	73	30	41
Generic Purpose	61	62	101
Consolidation	49	53	108
Audience	48	70	145
Text convention	32	62	192
Key Point	31	68	153
Information	25	68	268

Table 2. Percentage of Time Students Reflected on Rhetorical and Other Plans

As we know, students often have trouble with knowledge transforming tasks such as this one and often resort to reporting on what they know or have read. Scardamalia and Bereiter's evidence suggests that reflection can help students adapt their topic knowledge, to choose and evaluate the content of their papers given their rhetorical goals. However, in this context, where students had a very difficult time inferring and consolidating rhetorical goals in the first place, many students used reflection not to select and adapt topic knowledge as much as to formulate and refine their purpose and audience. Given the assignment, this was a functional use of reflective activity, a way-to solve a problem many freshman writers face: shaping purpose within a reading- to-write assignment.

Conclusions

This paper sheds light on many assumptions about reflection in collaborative writing. First of all, our transcripts suggest that collaboration does not necessarily produce reflection. When we immerse students in talk about writing, they may become more aware of their plans and ideas, but awareness doesn't guarantee they'll reflect on those ideas. Even the structured collaboration these students engaged in didn't automatically elicit reflection. We discovered that collaboration is a complex social and cognitive activity in which students must interpret and negotiate the collaborative process itself as well as their purpose for writing. The ways in which students interpret these demands can affect the criteria they use to reason about and evaluate their own process.

Our students' mixed approaches to collaboration suggest that some students need to see collaboration as a place to work on and refine ideas, as a means to problematize ideas rather than to recite them. Students like Mike and Yun Ho may need more explicit instruction in how to use each other as resources for refining and revising plans and in how to sustain this reflection so they can work on problems. Comparing and considering alternative plans may be one accessible and socially acceptable way for students like Mike and Yun Ho to go beyond reciting ideas and to find their way into reflective problem-solving. We might model different approaches to collaboration and the roles and interactions that result from them.

But whether and how students engage in reflection also depends on how they view the purpose and criteria of the writing task. One problem with difficult writing tasks such as the one studied here, is that students often approach those tasks in reductive ways. In this study, some students approached the assignment as a call for a thesis statement and some illustration, even though it required adaptation and rhetorical thinking. As a result, many students either did not recognize the need to reflect further on their goals and plans, or they chose to gloss over them. Although we can not ensure that students won't simplify complex writing tasks, we can do more to ensure that they *know* they are simplifying the task. One way to explicitly invite students to complicate task demands may be to complicate their notion of purpose. Bransford (1979) argues that "an important aspect of helping people learn to learn. . . involves the development of internal criteria that can guide their processes of self-evaluation." (237) We might contrast and model different interpretations of purpose for our students and the kinds of critical reflection and criteria that might accompany rhetorical purposes. Sometimes, simply making students aware of their own representation of a task and of other alternatives can itself produce changes in their approach to a task (see Flower, Stein, Ackerman, Kantz, McCormick & Peck, in press).

This study also provides support that reflection is related to quality of planning. Our descriptive analysis suggests why: sustained reflection helps students work through stages of problem solving-- finding problems and weaknesses, searching for alternative approaches and testing and evaluating those approaches. Students in this phase of learning to plan used reflection to work out *rhetorical* problems in planning-- problems frequently ignored or unrecognized by the students studied in other planning research. In particular, these students used reflection to struggle with purpose, audience and consolidations, instances in which they tried to interrelate the different aspects of their plans.

In summary, the cognitive literature suggests that reflection on one's own ideas and processes is a key component in problem-solving activities, especially in ill-defined or novel tasks which require planful coordination of goals, strategies and outcomes. Some composition research suggests that reflection assumes an important role in the planning stage of composing where

writers initially retrieve content knowledge and formulate rhetorical goals for a paper. Our observations support the claim that reflection *can* play a role in planning complex texts, however, this paper qualifies that claim by suggesting some factors that may affect *whether and how* student writers will use reflection in productive ways. If we are to understand the role of reflection in collaborative writing tasks, then we need to understand how students represent and negotiate the social and cognitive aspects of those tasks in the very process of their learning.

References

Applebee, A. (1981). *Writing in the secondary school.* (Research Monograph No. 21). Urbana, IL: National Council of Teachers of English.

Applebee, A. (1984). *Contexts for learning to write.* Norwood, NJ: Ablex.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1989). Human agency in social-cognitive theory. *American Psychologist, 44,* 1175-1184.

Baron, J. (1981). Reflective thinking as a goal of education. *Intelligence , 5,* 291-309.

Bereiter, C. & Scardamalia, M. (1987). *The psychology of written composition.* Hillsdale, NJ: Erlbaum.

Bitzer, L. (1968). The rhetorical situation. *Philosophy and rhetoric,1* (1), 1-14.

Bransford. J. (1979). *Human cognition: Learning, understanding and remembering.* Belmont CA: Wadsworth .

Bransford, J., Sherwood, R., Vye, N. & Rieser, J. (1986). Teaching, thinking and problem solving. *American Psychologist, 41,* 1078-1089.

Brown, A. (1985). Metacognition: The development of selective attention strategies for learning from texts. In H. Singer & R. Ruddell (Eds.), *Theoretical models and processes of reading* (pp. 501-526). Newark, DE: International Reading Association.

Brown, A., Campione, J. & Day, J. (1981). Learning to learn: On training students to learn from texts. *Education Researcher, 10,* 14-21.

Bruffee, K. (1984). Collaborative learning and the "conversation of mankind." *College English, 46,* 635-652.

Burtis, P., Bereiter, C., Scardamalia, M. & Tetroe, J. (1983). The development of planning in writing. In G. Wells & B. Kroll (Eds.), *Exploration in the development of writing* (pp. 153-174). Chichester, England: John Wiley & Sons.

Carey, L., Flower, L., Hayes, J., Schriver, K. & Haas C. *Differences in writers' initial task representations.* (1989). (Tech. Rep.No. 35) Berkeley CA: Center for the Study of Writing, University of California at Berkeley and Carnegie Mellon University.

Curtin, E. (1988). *The research paper in high school writing programs: Examining connections between goals of instruction and requirements of college writing.* Unpublished doctoral dissertation, Carnegie Mellon University, Pittsburgh.

Dewey, J. (1933). How we think: A restatement of the relation of reflective thinking to the educative process. Boston, MA: D.C. Heath and Co.

Duemler, D. and Mayer, R. (1988). Hidden costs of reflectiveness: Aspects of successful scientific reasoning. *Journal of Educational Psychology 80*, 419-423.

Durst, R. (1989). Monitoring processes in analytic and summary writing. *Written Communication, 6*, 340-363.

Flavell. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34* (10), 906-911.

Flower, L., Burnett, R., Hajduk, T., Wallace, D., Norris, L., Peck, W., & Spivey, N. (1989a). *Classroom inquiry in collaborative planning*. Pittsburgh, PA: Carnegie Mellon University.

Flower, L. & Hayes, J. (1981). A Cognitive process theory of writing. *College Composition and Communication, 32*, 365-387.

Flower, L., Higgins, L. & Petraglia, J. (In press). *Collaborative planning and the construction of meaning*. (Technical Report). Berkeley, CA: Center for the Study of Writing, University of California at Berkeley and Carnegie Mellon University.

Flower, L., Schriver, K., Carey, L., Haas, C. & Hayes, J. (1989b). *Planning in writing: the cognition of a constructive process*. (Technical Report No. 34). Berkeley, CA: Center for the Study of Writing, University of California at Berkeley and Carnegie Mellon University.

Flower, L. Stein, V. Ackerman, J. Kantz, M., McCormick, K., & Peck, W. (In press). *Reading-to-write: Exploring a cognitive and social process*. New York: Oxford University Press.

Forman, E. (1981). *The role of collaboration in problem-solving in children*. Unpublished doctoral dissertation, Harvard University, Cambridge, MA.

Forman, E. & Cazden, C. (1985). Exploring Vygotskian perspectives in education: The cognitive value of peer interaction. In J. Wertsch, (Ed.), *Culture, communication and cognition: Vygotskian perspectives* (pp. 323-347). New York: Cambridge University Press.

Freedman, S., Burnett, J ., & Dipardo, A. (1987). Peer groups at work in two writing classrooms. (Technical Report). Berkeley, CA: Center for the Study of Writing, University of California Berkeley and Carnegie Mellon.

Garner, R. (1987). *Metacognition and reading comprehension*. Norwood, NJ: Ablex.

Gere, A. (1987). *Writing Groups: History, theory and implications*. Carbondale: Southern Illinois University Press.

Glachan, M. & Light, P. (1982). Peer interaction and learning: Can two wrongs make a right? In G. Butterworth & P. Light (Eds.), *Social cognition* (pp. 238-262). Chicago: University of Chicago Press.

Higgins, L. (1989, March). Collaboration in the composition classroom: Theory meets practice. Paper presented at the 1989 Conference on College Composition and Communication. Seattle, WA.

Johnson, D. & Johnson, R. (1979). Conflict in the classroom: Controversy and learning. *Review of Educational Research , 49* (1), 51-69.

Krashen, Stephen. (1981). The monitor model for second language acquisition . In R. Gingras (Ed.), *Second language acquisition and foreign language learning*. Washington, D.C.: Center for Applied Linguistics.

Lunsford, A. & Ede, L. (1986). Why write. . . together: A research update. *Rhetoric Review, 5*, 71-78.

Nystrand, M. (1986). *The Structure of written communication: Studies in the reciprocity of writers and readers*. New York, NY: Academic Press

Palincsar, A. & Brown, A. (1984). Reciprocal teaching of comprehension-fostering and comprehension monitoring activities. *Cognition and Instruction 1* (2), 117-175.

Paris, S., Wasik, B. & Turner J. (In press). The development of strategic readers. In P. D. Pearson (Ed.) *Handbook of Reading Research* (2nd ed.). New York: Longman.

Paris, S. (1988, April). Fusing skill and will in children's learning and schooling. Paper presented at the annual meeting of the American Educational Researchers Association, New Orleans, LA.

Perkins, D. (1981). *The mind's best work*. Cambridge, MA: Harvard University Press.

Perret-Clermont, A. (1980). *Social interaction and cognitive development in children*. New York: Academic Press.

Petraglia, J., Flower, L. & Higgins, L. (In preparation). *Uncovering conceptions of purpose at work in the composition classroom*. (Technical Report). Berkeley, CA: Center for the Study of Writing, University of California Berkeley and Carnegie Mellon.

Rose, M. (1980). Rigid Rules, inflexible plans and the stifling of language: A cognitivist analysis of writers's block. *College Composition and Communication, 31*, 389-401.

Scardamalia, M., & Bereiter, C. (1987). Knowledge telling and knowledge transforming in written composition. In S. Rosenberg (Ed.), *Advances in Applied Linguistics*. New York: Cambridge University Press.

Smit, D. (1989). Some difficulties in collaborative learning. *Journal of Advanced Composition, 9* (1&2), 45-58.

Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: MIT Press.

Zimmerman, B. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81, 329-339*.